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| EXAMINER | |
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| HABTE, ZEWDU | |
| **ART UNIT** | **PAPER NUMBER** |
| 2661 | |

DATE MAILED: 04/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/897,001 | WEIL ET AL. | |
| | Examiner | Art Unit | |
| | Zewdu Habte | 2661 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1-27 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-11,13-21 and 23-27 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless --
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1-6 and 27 are rejected under 35 U.S.C. 102(e) as being anticipated by Swallow (US 6751190 B1).

As to claim 1, Swallow discloses a method of controlling re-routing of packet traffic from a main path [Fig. 1, primary tunnel 126, links 112, 114, 116 and 118] to a recovery path in a label switched packet communications network [Fig. 1, network communication 100] in which each packet is provided with a label stack containing routing information for a series of network nodes traversed by the packet [col. 1, lines 58 – 61, MPLS adds a label to a data packet to guide the data packets through nodes along a pre-defined path (a label stack containing routing information), see Fig. 7], the method comprising;

signaling over the recovery path control information whereby the label stack of each packet traversing the recovery path is so configured that, on return of the packet

from the recovery path to the main path , the packet has at the head of its label stack a recognizable label for further routing of the packet [col. 8, lines 4-45, (as illustrated in Fig. 9, once link failure is determined, node 104 establishes a bypass tunnel by determining the next node, blocks 900-904; the outgoing label entry (control information) is modified (recovery path configured) to reflect the changed route accordingly, block 906, and it routes the packet through node 120 to node 108 (back to the main path) using bypass tunnel 128); col. 8, lines 58-67 and col. 9, lines 1-9, intermediate node 108, seeing the same incoming value 806, performs the same operation on the same incoming label value 806 (a recognizable label).... Forwards the data packet to the receive node 110, through primary tunnel 126].

As to claim 2, Swallow teaches a method as claimed in claim 1, wherein said primary traffic paths and recovery traffic paths are defined as tunnels [Fig. 1, primary tunnel 126, bypass tunnel 128].

As to claim 3, Swallow teaches a method as claimed in claim 2, wherein each label in a said label stack identifies a tunnel via which a packet provided with the label stack is to be routed [Fig. 6A, extended tunnel ID 630].

As to claim 4, Swallow discloses a method of controlling re-routing of packet traffic from a main path [Fig. 1, primary tunnel 126, links 112, 114, 116 and 118] to a recovery path [Fig. 1, bypass tunnel 128, links 112, 122, 124 and 118] in a communications label switched packet network [Fig. 1, network communication 100], the method comprising;

signaling over the recovery path control information whereby each said packet traversing the path is provided with a label stack so configured that, on return of the packet from the recovery path to the main path, the packet has at the head of its label stack a recognizable label for further routing of the packet [col. 8, lines 4-45, (as illustrated in Fig. 9, once link failure is determined, node 104 establishes a bypass tunnel by determining the next node, blocks 900-904; the outgoing label entry (control information) is modified (recovery path configured) to reflect the changed route accordingly, block 906, and it routes the packet through node 120 to node 108 (back to the main path) using bypass tunnel 128); col. 8, lines 58-67 and col. 9, lines 1-9, intermediate node 108, seeing the same incoming value 806, performs the same operation on the same incoming label value 806 (a recognizable label).... Forwards the data packet to the receive node 110, through primary tunnel 126].

As to claims 5 and 27, Swallow discloses a method of controlling re-routing of an information packet [Fig. 4, path message] via a recovery path [Fig. 1, bypass tunnel 128] a first protection switching node [Fig. 1, node_A 104] and a second protection return node [Fig. 1, node_C 108] disposed on a main traffic path [Fig. 1, primary tunnel 126, links 112, 114, 116 and 118] in a communications label switched packet network [Fig. 1, network communication] in which each packet is provided with a label stack containing routing information for a series of network nodes traversed by the packet [col. 8, lines 40-57, (node_A 104 updates the outgoing label value in the label stack and forwards the packet to the next node)], the method comprising;

sending a first message from the first node to the second node via the recovery path, in reply to said first message sending a response message from the second node to the first node via the recovery path, said response message containing control information [col. 8, lines 17-22, (Swallow teaches in Fig. 9 the steps of establishing a bypass tunnel 128 between node_A 104 and node_C 108, after detecting that the link to node_B is not available in step 900; node_A determines next node_D, to forward path message or a first message; using the same method to establish the primary tunnel 126, as illustrated in Fig. 2 & 3, bypass tunnel 128 is established in step 904; node_A sends path message to node_D, knowing path message is forwarded to node_C, node_D forwards path message to node_C; node_C sends back RSVP control message or response message to reserve link resource to node_A)], and

at the first node, configuring the label stack of the packet such that, on arrival of the packet at the second node via the recovery path, the packet has at the head of its label stack a label recognizable by the second node for further routing of the packet [col. 8, lines 58-67 and col. 9, lines 1-9, intermediate node 108 seeing the same incoming value 806 performs the same operation on the same incoming label value 806 (a recognizable label).... Forwards the data packet to the receive node 110 through primary tunnel 126].

As to claim 6, Swallow discloses a method of controlling re-routing of packet traffic in a label switched packet communications network [Fig. 1, network communication 100] at a first node [Fig. 1, node_A 104] from a main path [Fig. 1, primary tunnel 126, links 112, 114, 116 and 118] to a recovery path [Fig. 1, bypass

tunnel 128, links 112, 122, 124 and 118] and at a second node [Fig. 1, node_C 108] from the recovery path to the main path, the method comprising exchanging information between said first and second nodes via the recovery path so as to provide routing information for the packet traffic at said second node [col. 8, lines 17-22].

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 7-10, 14, 16-18, 20 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swallow.

As to claims 7 and 16, Swallow discloses a method of fault recovery in a communications label switched packet network [Fig. 1, network communication 100] constituted by a plurality of nodes [Fig. 1, nodes 102, 104, 106, 108, 110] interconnected by links [Fig. 1, links 112, 114, 116 and 118] and in which each packet is provided with a label stack from which network nodes traversed by that packet determine routing information for that packet [col. 7, lines 3-6], the method comprising;

determining a ...of traffic path... for the transport of packets [Fig. 1, primary tunnel 126],

determining a ... of recovery path... for re-routing traffic in the event of a fault on a said traffic path [Fig. 1, bypass tunnel 128],

each said recovery path linking respective first and second nodes on a corresponding traffic path [Fig. 1, bypass tunnel 128 shows node_A linking node_C],

responsive to a fault between first and second nodes on a said traffic path, re-routing traffic between those first and second nodes via the corresponding recovery path [col. 8, lines 17-22],

sending a first message from the first node to the second node via the recovery path, in reply to said first message sending a response message from the second node to the first node via the recovery path, said response message containing control information [col. 8, lines 17-22, (Swallow teaches in Fig. 9 the steps for establishing a bypass tunnel 128 between node_A 104 and node_C 108; after detecting the link to node_B is not available in step 900; node_A determines next node_D to forward path message or a first message; using the same method to establish the primary tunnel 126 as illustrated in Fig. 2 & 3, bypass tunnel 128 is established in step 904; node_A sends path message to node_D, knowing path message is forwarded to node_C, node_D forwards path message to node_C; node_C sends back RSVP control message or response message to reserve link resource to node_A)], and,

at the first node, configuring the label stack of each packet traversing the recovery path such that, on arrival of the packet at the second node via the recovery path, the packet has at the head of its label stack a label recognizable by the second node for further routing of the packet [col. 8, lines 58-67 and col. 9, lines 1-9,

intermediate node 108, seeing the same incoming value 806, performs the same operation on the same incoming label value 806 (a recognizable label).... Forwards the data packet to the receive node 110 through primary tunnel 126]. Swallow teaches to bypass a node in the pre-defined path [abs. lines 7-9, ...pre-defined (pre-positioning)], and illustrates a portion of network 100 [col. 3, lines 9-10]; he does not specifically teach a plurality set of primary and a plurality set of recovery paths; but it would have been obvious to one of ordinary skill in the art to duplicate Swallow's teaching of the pre-defined primary and bypass paths for purpose of providing a network with a plurality set of primary traffic paths and a plurality set of recovery traffic paths. The motivation is to provide real-time packet transmitting service with least-cost routing.

As to claim 8, Swallow discloses a method of fault recovery in a packet communications network [Fig. 1, network communication 100] comprising a plurality of nodes [Fig. 1, nodes 102, 104, 106, 108, 110] interconnected by communications links [Fig. 1, links 112, 114, 116 and 118], in which each packet is provided with a label stack containing routing information for a series of network nodes traversed by the packet [col. 7, lines 3-6], the method comprising;

determining and provisioning a ... primary traffic path... for traffic carried over the network [col. 3, 9 -15 (Swallow teaches the establishment of a primary tunnel 126)];

determining a ... recovery traffic path... [col. 3, 28–31] and pre-positioning those recovery paths [col. 2 , 26–35 (Swallow teaches that the bypass tunnel is established and determined before the primary path fails)];

and in the event of a network fault affecting a said primary path, signaling an indication of the fault condition [col. 8, 5–7, (a node discovers by lack of a signal from the forward node, that it cannot send packets to the forward node, since the forward node is down)], to each said node so as to re-route traffic from that primary path to a said recovery paths [col. 8, 7-21, (Swallow teaches that in the data packet label, information is stored that indicates an adjacent node, over which that packet can travel as an alternate route, should the primary route be unavailable)] ,

and signaling over the recovery path control information whereby the label stack of each packet traversing a said recovery path is so configured that, on return of the packet from the recovery path to the main path, the packet has at the head of its label stack a recognizable label for further routing of the packet [col. 8 22-67 to col. 9, 1-9, (with the bypass tunnel established, the packet traverses the alternate network until intermediate node 108 sees the incoming label value 806; then it sends the packet back to its primary path, 110)]. Although Swallow illustrates a portion of network 100 [col. 3, lines 9-10], he does not specifically teach a set of primary and a set of recovery paths; but, it would have been obvious to one of ordinary skill in the art to duplicate Swallow's teaching of the pre-defined primary and bypass paths for the purpose of providing a network with a set of primary traffic paths and a set of recovery traffic paths. The motivation is to provide real-time packet transmitting service with least-cost routing.

As to claims 9 and 17, Swallow discloses a packet communication network [Fig. 1, network communication 100] comprising a plurality of nodes [Fig. 1, nodes 102, 104, 106, 108, 110] interconnected by communication links [Fig. 1, links 112, 114, 116 and

118] and in which tunnels are defined for the transport of high quality of service traffic [col. 1, lines 58-61, (MPLS adds message identification object to identify message type and tunnel identification for a real-time data transfer that requires high quality of service)], the network comprising;

means for providing each packet with a label stack containing routing information for a series of network nodes traversed by the packet [col. 7, lines 3-6];

means for determining and provisioning a ... primary traffic path... within said tunnels for traffic carried over the network [col. 3, 9-15 (Swallow teaches the establishment of a primary tunnel 126)];

means for determining a ... of recovery traffic path... within said tunnels and for pre-positioning those recovery paths [col. 2 , 26–35 (Swallow teaches that the bypass tunnel is established and determined before the primary path fails)];and

means for signaling over a said recovery path control information whereby each said packet traversing that recovery path is provided with a label stack so configured that, on return of the packet from the recovery path to a said main path, the packet has at the head of its label stack a recognizable label for further routing of the packet [col. 8, lines 22-67 to col. 9, lines 1-9, (with the bypass tunnel established, the packet traverses the alternate network until intermediate node 108 sees the incoming label value 806; then it sends the packet back to its primary path, 110)]. Although Swallow illustrates a portion of network 100 [col. 3, lines 9-10], he does not specifically teach a set of primary and a set of recovery paths; but, it would have been obvious to one of ordinary skill in the art to duplicate Swallow's teaching of pre-defined primary and bypass paths for the

purpose of providing a network with a set of primary traffic paths and a set of recovery traffic paths. The motivation is to provide real-time packet transmitting service with list cost routing.

As to claim 10, Swallow discloses wherein said primary traffic paths and recovery traffic paths are defined as label switched paths [MPLS pre-define paths by adding a label to a data packet in a network, and a pre-define path is called a Label Switched Path, LSP].

As to claims 14 and 24, Swallow discloses wherein said signaling of the fault detection is performed by the node as a sub-routine call [Fig. 9, (step 900 is done by each node in a routine, successively)].

As to claim 18, Swallow discloses a packet communications network [Fig. 1, network communication 100] comprising a plurality of nodes interconnected [Fig. 1, nodes 102, 104, 106, 108, 110] by communications links [Fig. 1, links 112, 114, 116 and 118], and in which network tunnels are defined for the transport of high quality of service traffic [col. 1, lines 58-61, (MPLS adds message identification object to identify message type and tunnel identification for a real time data transfer that requires high quality of service)], the network comprising;

means for determining and provisioning a ... of primary traffic path... within said tunnels for traffic carried over the network [col. 3, 9-15 (Swallow teaches the establishment of a primary tunnel 126)];

means for determining a ... of recovery traffic path... within said tunnels and for pre-positioning those recovery path ...[col. 2 , 26–35 (Swallow teaches that the bypass tunnel is established and determined before the primary path fails)];

and in the event of a network fault affecting ... of said primary path..., signaling an indication of the fault condition to each said node so as to provision said ... of recovery traffic path... [col. 8, 5–7, (a node discovers by lack of a signal from the forward node, that it cannot send packets to the forward node, since the forward node is down)]. Although Swallow illustrates a portion of network 100 [col. 3, lines 9-10], he does not specifically teach a set of primary and a set of recovery traffic paths; but, it would have been obvious to one of ordinary skill in the art to duplicate Swallow's teaching of pre-defined primary and bypass paths for the purpose of providing a network with a set of primary traffic paths and a set of recovery traffic paths. The motivation is to provide real-time packet transmitting service with list cost routing.

As to claim 20, Swallow discloses a network as claimed in claim 17, wherein each said node comprises a router [col. 3, lines 38-40].

3. Claims 11,13 and 21,23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swallow as applied to claims 9 and 17 above, and further in view of Thomas (US 6512768 B1).

As to claims 11, 13, 21 and 23, Swallow does not disclose keep-alive messages over links to its neighbors, but Thomas teaches [col. 9, lines 20-34, (keep-alive messages send to a next node periodically, but once the keep alive timer expires the default condition detected)]. It would have been obvious to one of ordinary skill in the

art to combine Swallow with Katsube for a purpose of exchanging messages between neighboring nodes in order to update forwarding table in a node. The motivation is to minimize transmission time by detecting a link failure between nodes in advance.

4. Claims 15, 25 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Swallow and Thomas as applied to claims 12 and 22 above, and further in view of Hsu (US 6363319 B1).

As to claims 15 and 25, neither Swallow nor Thomas disclose wherein each said node creates a link state database which models the topology of the network in the routing domain, but Hsu discloses it [col. 5, lines 55-63]. It would have been obvious to one of ordinary skill in the art to combine Swallow and Thomas with Hsu for the purpose of having a link state database. The motivation is to identify links so bandwidth gets allocated according to requirement for direction oriented links.

As to claim 26, Swallow discloses a network as claimed in claim 25 and comprising a multi-service protocol label switched (MPLS) network [col. 3, lines 42-44].

5. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Swallow in view of Hsu.

As to claim 19, Swallow discloses a communications packet network [Fig. 1, network communication 100] comprising a plurality of nodes [Fig. 1, nodes 102, 104, 106, 108, 110] interconnected by communication links [Fig. 1, links 112, 114, 116 and 118] and in which tunnels [Fig. 1, primary tunnel 126, bypass tunnel 128] are defined for the transport of high quality of service traffic [col. 1, lines 58-61, (MPLS adds message identification object to identify message type and tunnel identification for a real time data

transfer that requires high quality of service)], the network having a first ... of primary traffic path... within said tunnels [col. 3, 9-15 (Swallow teaches the establishment of a primary tunnel 126)];

and a first ... of pre-positioned recovery traffic path... within said tunnels for carrying traffic in the event of a fault affecting ... said primary path...[col. 2 , 26–35 (Swallow teaches that the bypass tunnel is established and determined before the primary path fails)], wherein the network comprises;

fault detection means responsive to a fault condition for signaling to the network nodes an indication of said fault so as to provision said first ... of recovery path...[col. 8, 5–7, (a node discovers, by lack of a signal from the forward node, that it cannot send packets to the forward node, since the forward node is down) and col. 8, lines 17-22, node_A sends path message to node_D to intermediate node_C (in the process, each nodes updates its routing table for the signal sent from node_A; node_C sends back a RSVP control message)];

path provisioning means for provisioning said ... of primary traffic path... and said ... of recovery traffic path...[col. 3, 9-15 (Swallow teaches the establishment of a primary tunnel 126)]; and

path switching means for switching traffic to said ...primary path...[col. 8, lines 22-67 to col. 9, lines 1-9, (with the bypass tunnel established, the packet traverses the alternate network until intermediate node 108 sees the incoming label value 806; then it sends the packet back to its primary path, 110)]. Swallow teaches how to bypass a node in the pre-defined path [abs. lines 7-9, ...pre-defined (pre-positioning)], and

illustrates a portion of network 100 [col. 3, lines 9-10]; he does not specifically teach a plurality set of primary and plurality set of recovery paths; also, Swallow does not teach path calculation means. Hsu teaches path calculation means [col. 5, lines 43-46]. It would have been obvious to one of ordinary skill in the art to duplicate Swallow's teaching of pre-defined primary and bypass paths for purpose of providing a network with a plurality set of primary traffic paths and a plurality set of recovery traffic paths, and to combine Swallows pre-defined bypass tunnel for failed communications link with Hsu's path calculation means to a network, to be able to pick the shortest protection path. The motivation is to provide real-time packet transmitting service with least-cost routing.

***Allowable Subject Matter***

6. Claims 12 and 22 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Conclusion***

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zewdu Habte whose telephone number is 571-272-3115. The examiner can normally be reached on 8:30-5:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen, can be reached on 571-272-3126. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval

(PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Zewdu Habte (Zed)
Examiner
Art Unit 2661

ZH
April 18, 2005

KENNETH VANDERPUYE
PRIMARY EXAMINER